14

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THE HEREDITARY TRANSMISSION OF HYPOSPADIAS.

Although the principle of hereditary transmission of various deformities and abnormalities, such as supernumerary fingers, toes, hare-lip, moles, and other dermal peculiarities, is well recognized, few well-authenticated cases in which one or other of the above-named peculiarities has been known to be transmitted through two or three or more generations have been recorded. Among hereditary malformations, hypospadias has long been recognized as a not uncommon hereditary condition. Mere reference to the list of authorities appended suffices to show this. In the cases referred to below, which I have been able to collect, it will be seen that hypospadias occurring in several members of the same generation is by no means uncommon. Sir Everard Home relates a case of a family of three children, of whom the first was a hypospadian, the second, a girl, was normal, and the third child, a boy, was a hypospadian.

Equally well-authenticated instances in which the deformity has appeared in two successive generations are recorded by Morgagni, Shorthouse, and others. The case described by Shorthouse is of sufficient interest to be quoted. The patient, a poor woman, had mutilated hands, apparently examples of inter-uterine amputation.

The fourth and fifth fingers of each hand were absent, but were represented by the small wart-like or mammillary stump typical of inter-uterine amputation. The husband of this woman was a hypospadian. They had a family of six children, of whom four were boys and two were girls. All the four boys inherited the urethral imperfection. Both the girls were born with mutilated hands.

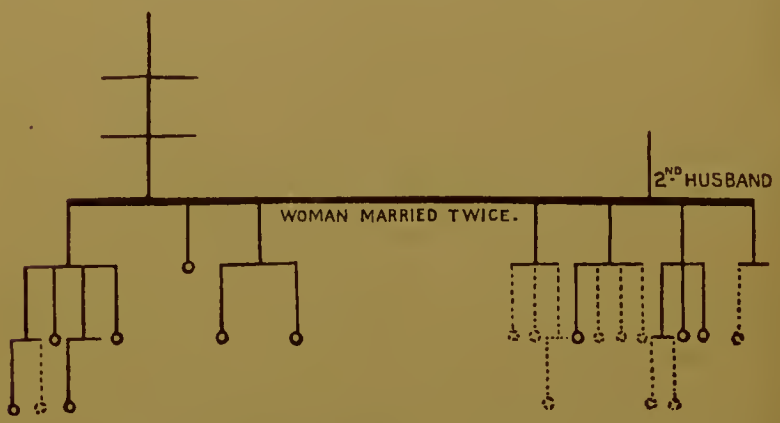
It is not a matter of great difficulty to trace family peculiarities through two generations. When, however, we seek to follow such variations through three or more generations the task is not so easy. In looking through the literature of the subject I have found such cases diminish in an inverse ratio as I have proceeded. Perhaps the most trustworthy record in which the hypospadiac deformity has persisted through three generations is that cited by Rigaud of Strasburg. In this instance there were three brothers hypospadians. One of these brothers had a son, also a hypospadian. This son became the father of six children, in three of whom the urethral anomaly reappeared. The above cases amply prove the possibility of such a deformity as hypospadias being passed on through successive generations from father to son, and even through the female line.

I will now give the record of a case which corroborates in a striking manner the cases narrated above. At the beginning of this century a hypospadian, whose father and grandfather were also hypospadians, contracted a marriage with a lady not related to him, who bore him three sons, hypospadians. The eldest of these sons married, and in his turn became the father of four other hypospadians; of these four sons two married, the first procreating two fresh hypospadians, the second becoming the father of one. The two other brothers did not

marry. Here we have the deformity transmitted in the direct male line from father to son through six generations.

I now come to a most interesting, and, as far as I am aware in the human being, unusual example of that condition to which Dr. Sedgwick has given the name of "indirect atavism." All breeders of cattle and other animals are familiar with the fact of the females throwing back—that is, reproducing after impregnation by a second male—the peculiarities of some other male by whom they had been previously impregnated. That this is not impossible in the human female is proved by the following case. The third of the six hypospadians just referred to died a few years after the birth of his three sons. His widow within eighteen months after his death contracted a second marriage, the husband in this instance not being a hypospadian, and having no history of any such deformity in his family. By this marriage she had four sons, all hypospadians. Two of these hypospadiac sons had hypospadians in their turn. But, as will be seen on reference to the accompanying schema, one of these sons had three boys without any deformity, although the eldest boy was a hypospadian. The acquired predisposition of the mother thus gradually wore itself out. Unfortunately, it has been impossible to trace the history through the females of these six generations. It may fairly, however, be presumed that one or more of them transmitted the hereditary peculiarity to some of their male offspring. In support of this, however, Heuremann, quoted by Arnaud, may be mentioned. In this instance the females of one family had for several generations given birth to males, all of whom were affected with hypospadias. Further, Lecat states that minor degrees of hypospadias not unfrequently

run in families in Normandy. In connexion with the transmission of hereditary peculiarities I may relate the following case, the details of which I have ample authority for knowing to be unimpeachable. In this instance a large mole, with a diameter of an inch and a half, has been observed on the inner aspect of the left thigh in the males of three generations, the females as



The black lines denote the subjects of hypospadias. The dotted lines denote the children of hypospadiac fathers, themselves normal.

well as their children through these generations being free from the mark.

In conclusion, the case which I have recorded above, of transmission of hypospadias through six generations, fully demonstrates the proposition, that hypospadias, among other deformities, cannot always be regarded as an accident or freak of Nature.

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